

**Status of *Rhinocyllus conicus* (Coleoptera: Curculionidae):  
A Biological Control Agent of *Carduus nutans* (Compositae)  
Established in Kentucky**

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ABSTRACT

*Rhinocyllus conicus* Froelich, the larvae which destroy seeds developing within the flower heads of nodding thistle (*Carduus nutans* L.), was introduced into Kentucky at 2 locations in 1974 as a biocontrol agent. This insect was recovered in 13 central and 4 southern Kentucky counties during surveys in 1988-1990. Adults were collected and released on thistle stands in other areas to extend the distribution of the weevil in areas infested with the weed.

INTRODUCTION

*Carduus nutans* L., known as nodding or musk thistle, was accidentally introduced into the United States from Europe in the early 1900s (1). Subsequently, it has spread over much of North America and has become a significant problem weed, especially in pastures, noncrop land and along rights-of-way. In pastures, this spiny plant competes with desirable forages and discourages cattle from grazing in or near infested areas (2). This plant has been identified as one of the 10 most troublesome weeds in Kentucky (3). Nodding thistle may be controlled with herbicides and an integrated approach utilizing cultural, chemical, and mechanical practices (4). Infestations often occur in rough terrain where neither chemical treatment nor mowing are feasible. The use of biological control agents provides a promising means of managing this noxious weed.

Larvae of the curculionid *Rhinocyllus conicus* Froelich develop within the seed head of musk and plumeless thistle and reduce the number of viable seeds produced by infested plants (5). This insect is one of the species that attack thistles in Europe and was introduced into the United States as a biological control agent. Successful establishment of the weevil has been reported in Virginia (6), Missouri (7), Montana (8), and southern California (9) to augment other weed control practices. Adults of this weevil were released at single sites in

Fayette and Warren counties in Kentucky in 1974. Documentation of specific sites and numbers of insects involved in the releases are not available and no studies on the establishment and spread of this insect have been conducted. In June 1988, a landowner in eastern Fayette County submitted samples of *Carduus nutans* seed heads that were being damaged by an insect, which was subsequently identified as *Rhinocyllus conicus*. This paper reports the results of a survey to determine the distribution of this beetle in Kentucky.

MATERIALS AND METHODS

Surveys for the presence of *R. conicus* were conducted during late May and early June 1988-1990 by examining thistle flowers along roadside rights-of-way and pastures in central and southern Kentucky. At that time, adults were feeding on thistle stems and leaves, and females were ovipositing on the bracts of flower heads. The weevils can be found easily by examining flower heads. The location (road and mile marker) of each site where adults were found was recorded. Stops were made at approximately 8 km intervals along a route until examination of at least 20 plants at 2 consecutive thistle stands failed to yield the insects. At this point, another route was selected. Sites at which weevils were found were mapped and subsequent trips were planned to further define the distribution of the insect.

RESULTS AND DISCUSSION

The known distribution of *Rhinocyllus conicus* is shown in Figure 1. Surveys in 1988 were

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